



PRA ESTUARY COMMUNITY-BASED FISHERIES MANAGEMENT PLAN

WESTERN REGION, GHANA



MINISTRY OF FISHERIES AND
AQUACULTURE DEVELOPMENT (MOFAD)
FISHERIES COMMISSION

ACKNOWLEDGEMENTS

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This document is dedicated to the late Emmanuel Ohene Marfo (formerly of Fisheries Commission – Western Region) who supported many field engagements and information sharing to make this plan a success.

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Cover photos:

- Upper Left: Black Chin Tilapia being measured for total length (Credit: Charles Amos, FoN)
- Upper Right: Women fishing in the Pra river with their bare hands (Credit: Philip Prah, FoN)
- Bottom Left: Fisherman casting a net in the Pra River (Credit: Philip Prah, FoN)
- Bottom Right: Fishing net being measured for compliance with fisheries regulations (Credit: Theophilus Boachie-Yiadom, FoN)

LIST OF ACRONYMS

CSO	Civil Society Organisations
DO	Dissolved Oxygen
EPA	Environmental Protection Agency
FASDP	Fisheries and Aquaculture Sector Development Plan
FC	Fisheries Commission
FoN	Friends of the Nation
GPS	Global Positioning System
IEC	Information Education Communication
IUCN	International Union for the Conservation of Nature
LI	Legislative Instrument
LULC	Land Use and Land Cover
NMFMP	National Marine Fisheries Management Plan
MTDP	Medium Term Development Plan
PRAs	Participatory Rural Appraisals
SDA	Shama District Assembly
SFMP	Sustainable Fisheries Management Project
UCC	University of Cape Coast
USAID	United States Agency for International Development
WD/FC	Wildlife Division of the Forestry Commission

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CO-MANAGEMENT AGREEMENT

WHEREAS, the Pra River estuary is a significant small-scale artisanal fishery utilized by several communities living adjacent to its shoreline, and provides significant food security and income for fisherfolk from these communities.

WHEREAS, the Fisheries Act, 2002 (Act 625), section 2 (a), provides for the Fisheries Commission to prepare and keep under continual review plans for the management and development of fisheries in waters under the jurisdiction of Ghana.

WHEREAS, the Fisheries Act, 2002 (Act 625), section 2 (g), provides for promotion of cooperation among local fishermen to advance development of artisanal fishing.

WHEREAS, the Fisheries Act, 2002 (Act 625), section 9 (1), authorizes the Commission to appoint committees it considers necessary for the effective implementation of its functions.

WHEREAS, the Fisheries Act, 2002 (Act 625), section 38, provides for application of a portion of the Fisheries Development Fund towards the development of small scale fisheries in the country.

WHEREAS, this Community Based Fisheries Management Plan prepared by the Commission is consistent with provisions in section 42 (1) of the Fisheries Act, 2002 (Act 625).

WHEREAS, the Commission can develop a fishery plan that relates to a specific water area and specified species of fish, consistent with section 42 (2) of the Fisheries Act, 2002 (Act 625).

WHEREAS, Section 42 (3) of the Fisheries Act, 2002 (Act 625) provides for the Commission to collaborate with such State agencies as the Commission considers appropriate for the implementation of each fishery plan and consistent with section 10 (5) of the Local Government Act, 1993 (Act 462) and section 12 (5) of the Local Government Act, 2016 (Act 936).

WHEREAS, the contents of this management plan are consistent with section 43 of the Fisheries Act, 2002 (Act 625).

WHEREAS, the preparation of this fishery management plan was undertaken following consultations with appropriate organisations, authorities, and persons affected by the fishery plan as stipulated in Section 44 of the Fisheries Act, 2002 (Act 625).

THEREFORE, I HEREBY

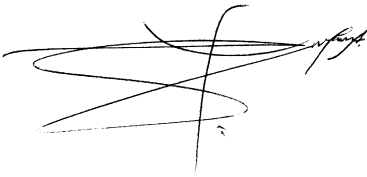
Declare the area consisting of the zone from the closing line along the mouth of the Pra River where it enters the Atlantic Ocean, and associated mangroves and wetland habitats up north to the first bridge crossing the Pra river, with special attention to the Tilapia species, *Sarotherodon melanotheron*, a Fisheries Management Area, solely for the purposes of fisheries management.

Delegate to the Pra Estuary Co-Management Group, a duly registered association, the authority for the responsible and sustained management and conservation of the fisheries resources in this area, and are granted exclusive use rights to the fishery resources in this area.

Authorize the Fisheries Commission to make allocations annually from the Fisheries Development Fund and or other budget lines, to support the Co-Management Group and the Co-Management Committee in the implementation of this plan.

Delegate responsibility for the oversight of this committee to effectively carry out its delegated functions, to the Regional Director, Fisheries Commission.

Approved by:

A handwritten signature in black ink, appearing to read 'M. Dadzie', with a large, stylized flourish extending to the left.

Date: December 22, 2020

Michael Arthur-Dadzie Esq.
The Executive Director, Fisheries Commission, Ghana

1.0 INTRODUCTION

This Co-Management Plan is designed for management of the fishery of the Pra estuary located in the Shama District of the Western Region of Ghana. The Pra estuary is approximately 100m wide at the point of entry into the sea and is an area of high landscape value covering a biologically rich and diverse ecosystem comprising mangrove forests, salt marshes and swamps. It falls within the geographic space lying to the South-South East border of Shama District.

Ecological assessments in the Pra estuary and its associated wetlands have shown nearly 30 fish species of marine, brackish and freshwater origins. The wetland area has an extensive mangrove forest which provide spawning grounds for these species of fish. The fishery of the Pra estuary provides direct livelihoods for about 10,000 people and indirectly supports over 15,000 women and children¹.

However, the fishery is declining due to over-exploitation of the fisheries resources through illegal and unsustainable fishing practices, siltation of the river and degrading water quality attributable to illegal mining activities. Other threats include over exploitation of mangroves and agricultural activities along the river. Human-induced degradation, in addition to other factors have accelerated the decline in fish harvested from the Pra River and its associated tributaries. Consequently, the need to promote conservation and improve management of the Pra estuary fishery has been strongly advocated for by stakeholders.

In 2014, Friends of the Nation (FoN), with funding from the International Union for Conservation of Nature (IUCN) provided support to Anlo Beach (a community situated within the Pra estuary) to restore degraded wetland areas with about 100,000 mangrove seedlings. The effort to restore degraded mangrove sites to revamp fisheries livelihood in the area was well appreciated by the Shama District Assembly as well as communities within the estuary. Over time it was noticed that the mangrove conservation alone was not adequate to revamp the fishery and therefore the development of a comprehensive fisheries co-management plan was initiated.

In view of this, FoN in collaboration with the Shama District Assembly and the Western Region Fisheries Commission with support from the USAID/Ghana Sustainable Fisheries Management Project (SFMP)², conducted series of studies and stakeholder engagements in 2016 towards the development of this fisheries co-management plan.

The legal basis of this plan is derived from Section 2, subsection (2a) of Ghana's Fisheries Act, 2002 (Act 625) which mandates the Commission to prepare fisheries management plans for the development of the fisheries in waters under the jurisdiction of Ghana. Sections 42, 43, 44 and 45 of Act 625 provide guidance for the development of fisheries management plans. This Pra Estuary Community Based Fisheries Management Plan therefore follows the provisions stipulated in the Fisheries Act, 2002 (Act 625). This plan is also consistent with Ghana's Fisheries and Aquaculture Policy and the National Co-Management Policy.

¹ Source: Key informant interviews and focus group discussions with all 11 communities and Shama District Assembly

² Sustainable Fisheries Management Project (SFMP) is a five year project funded by USAID Ghana from 2014 to 2019 with the goal to contribute to rebuilding targeted fish stocks.

The purpose of this fisheries co-management plan is to promote the sustainable management and development of priority fisheries in the Pra estuary and enhance benefits to those involved in fishing, processing and the marketing value chain. The plan aims at addressing the declining fish stocks and improving the welfare of those dependent on the fisheries for their livelihoods. The target species of this management plan is the Black-chin Tilapia, *Sarotherodon melanotheron*.

This Co-Management Plan was developed with inputs from community stakeholders based on local knowledge existing in the area. The process involved bottom-up approach including community meetings, Participatory Rural Appraisals (PRAs), collaborative research with the participation of local fishers, women fish processors and other relevant stakeholders. Community members generated the objectives for this plan, identified the fish species to be managed including the jurisdiction, mandate and management actions considered appropriate to improve the fisheries in the area. Eleven (11) communities within the Pra River estuary volunteered fifteen (15) representatives for the formation a Co-Management Committee to lead implementation of this plan.

The Fisheries Commission (FC), Shama District Assembly (SDA) and other key stakeholders including Wildlife Division of the Forestry Commission (WD/FC), University of Cape Coast (UCC), and Environmental Protection Agency (EPA) provided technical support for the drafting of this plan and have indicated strong will and commitment to support the Fisheries Co-management Committee and follow through with the implementation of this plan.

This plan is a living document, subject to review annually and will be revised at least every four years by the communities and stakeholders. The plan is designed to be adaptive and is expected to change over time, taking into account environmental changes and fluctuations including those that may be caused by climate change, to allow for the efficient and timely introduction of new management measures and strategies warranted by changing circumstances and situations in the fishery. This plan will also serve as a model for replication in other communities by stakeholders who seek to promote sustainable fishery management in their local communities.

The development of this Pra River estuary Community Based Fisheries Management Plan has been supported by the Sustainable Fisheries Management Project (SFMP) funded by USAID-Ghana and implemented by a consortium led by the Coastal Resources Center of the University of Rhode Island. Friends of the Nation assisted the Fisheries Commission in the drafting of this plan following stakeholder engagements.

2.0 BACKGROUND: PRA RIVER ESTUARY AND FISHERY MANAGEMENT AREA

2.1 Location and Description of Pra Estuary

This co-management plan is designed for the management of the tilapia fishery in the Pra River Estuary located in the Shama District of the Western Region of Ghana. The Pra river system is the longest in south western Ghana and the second largest discharge of fresh water into the Gulf of Guinea in Ghana. The Pra River takes its source from the Kwahu Plateau near Mpraeso in the Eastern Region of Ghana and flows southward for about 240 km through its estuary at Shama. The estuary is approximately 100m wide at the point of entry into the sea and is an area of high landscape value covering a biologically rich and diverse ecosystem comprising mangrove forests, salt marshes and swamps. The estuary falls within the geographic area lying to the South-South East border of Shama District.

The estuary is characterized by extensive mangrove forest which offer ecosystem services and provide habitat for animal species such as birds and reptiles. The bird species are thought to have been over-exploited by locals. Although the wetland habitats are important nursery grounds for many estuarine and marine fish species, the mangroves which are very important components of the habitat are currently under threat. About fifteen years ago, oysters *Crassostrea tulipa* were abundant in areas where the mangroves thrived, but they no longer exist. The reasons for the disappearance of the oysters have not been scientifically investigated. However, some locals ascribe this to the over-exploitation, while others attribute the disappearance to possible siltation of the river as a result of illegal mining activities.

In addition to coastal erosion, human actions which have adversely impacted the fishery include illegal fishing (such as fishing with mosquito nets and beach seine nets) in the estuary, poor water quality, over exploitation of mangroves and some agricultural practices within the wetlands.

An environmental quality assessment conducted by Friends of the Nation in 2014 established that water quality in various tributaries of the Pra River has been compromised through human activities. Three mangrove species (*Avicennia germinans*, *Laguncularia racemosa*, and *Rhizophora mangle*) were found to dominate the Pra river estuary. *Rhizophora mangle* has been over-exploited because it is the preferred fuelwood for smoking fish in the area. The total area of the estuary is about 1,780.3 hectares and present Land Use and Land Cover (LULC) maps have shown that the area has undergone considerable changes.

2.2 Physical Vulnerabilities of the Pra Estuary

The ecology of the Pra River estuary has been greatly affected by several factors including natural and anthropogenic stressors. The resultant negative effects are experienced by the surrounding communities. Flooding is a major phenomenon that adversely impacts and degrades the natural environment within the Pra River estuary. Flooding which occurs during the raining season normally leads to some communities getting cut off or isolated from social and economic interactions with others. Erosion is also common in most communities. In 2017, three incidences of rapid erosion combined with storm events caused the Anlo Beach community to be completely cut off with all access road inundated. These developments led to the decision by the

Shama District Assembly to consider and prioritise resettlement of the entire community in their Medium Term Development Planning (MTDP).

Anlo Beach community situated within the Pra river estuary has been the focus for many ecological and socio-economic studies as well as media reportage - Johnson (2000), Friends of the Nation (2013), Friends of the Nation (2014), Okyere (2014), Department of Fisheries and Aquatic Sciences (2016), Graphic Online (2017) and Citifmonline.com (2017) among others. Okyere (2014) indicated that water quality (including turbidity, dissolved oxygen, nitrates and phosphate concentrations) has been compromised. The study indicated excessively high turbidity caused by suspended sediments from illegal mining activities upstream. These suspended sediments leached high levels of nitrates and phosphate into the estuarine water. However, the elevated level of phosphate is not accompanied by a correspondingly high level of phytoplankton production due to limited light penetration into the water column. The river water was also described by the Ghana Water Company Limited as very turbid with high measurements of color units.

Harmful chemicals such as mercury and cyanide used by miners and pesticides used by farmers have polluted the estuarine ecosystem. Okyere's study indicated that the concentrations of nitrates and total phosphates in most areas within the Pra river estuary were far beyond the range recommended as suitable for healthy coastal ecosystem functioning. Nonetheless, pH values occur within tolerable limits for aquatic life.

2.3 Fishery Management Area

All communities within the Pra River estuary were engaged through a Participatory Rural Appraisal processes and the communities earmarked a total area of about 3,190 Ha, as the management area under the jurisdiction of this plan with clearly defined boundaries as shown in Figure 1. The area starts from the estuary and up north to the main bridge on the Pra River at Beposo and consists of the area from the closing line along the mouth of the Pra River where it enters the Atlantic Ocean and associated mangrove and wetland habitats. Within the management area, community members provided local ecological knowledge including perceived fish breeding grounds (Figure 2) where management actions will be concentrated.

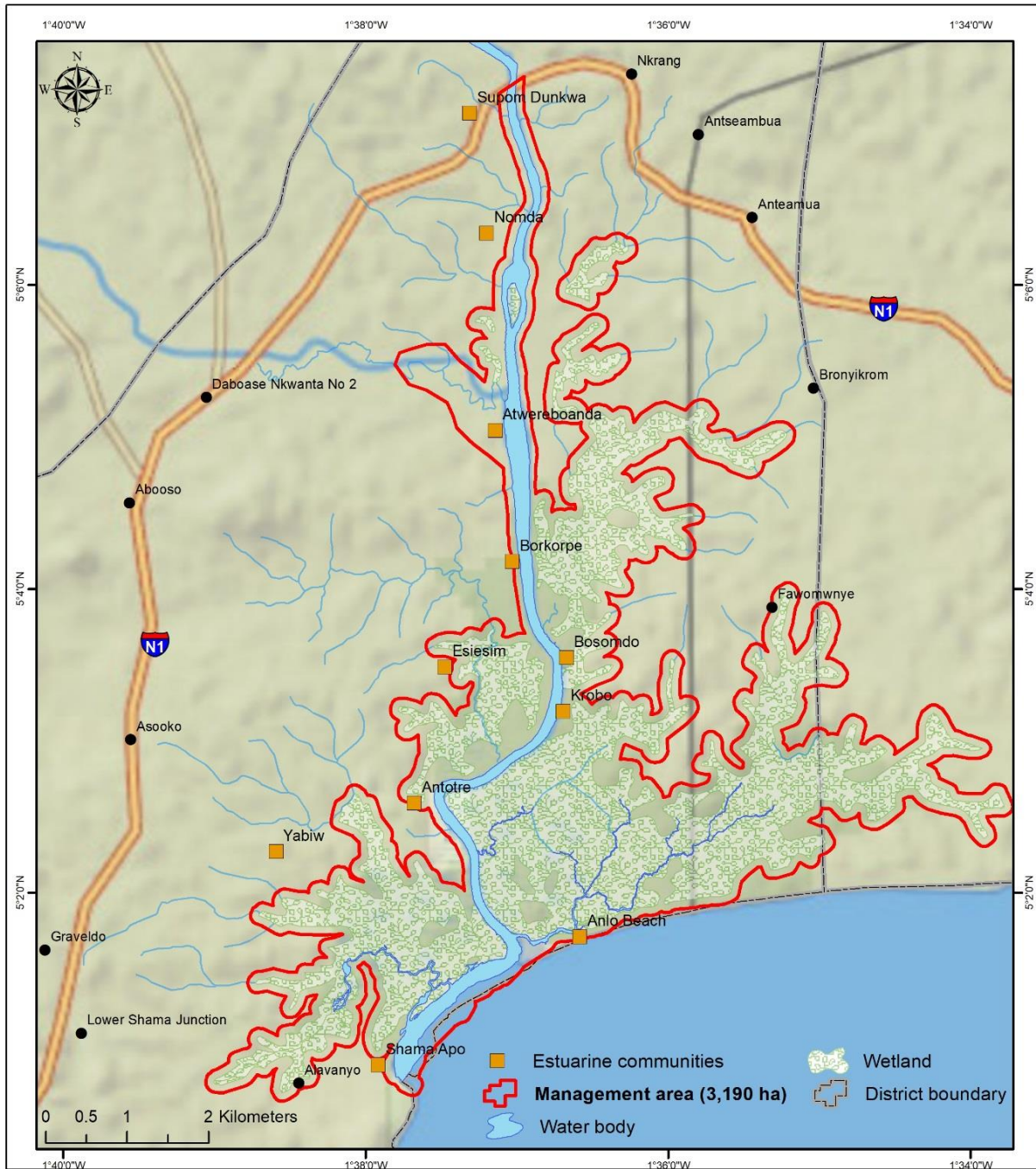


Figure 1: Map of the Pra Fishery Management Area Covering a Total of 3,190 Hectares

(Source: Friends of the Nation/Hen Mpoano, 2017)

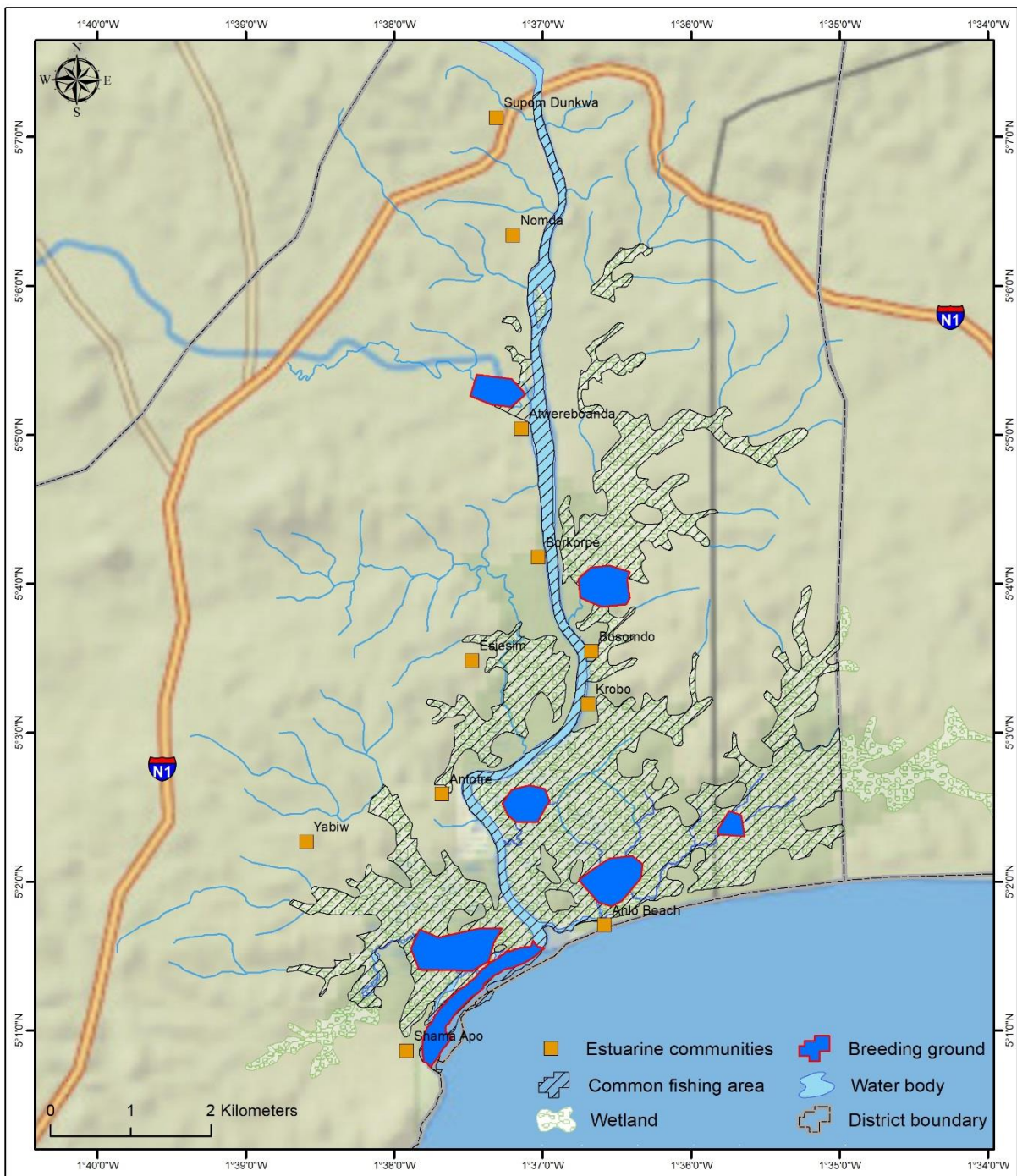


Figure 2: Map showing perceived breeding grounds of most fish species within the entire management area, from local ecological knowledge

(Source: Friends of the Nation/ Hen Mpoano, 2017)

3.0 DESCRIPTION OF THE FISHERY

The Pra estuary is a multi-species fishery, comprising marine, brackish water and freshwater fin and shellfish. A total of thirty-two (32) species from nineteen (19) families have been identified in the Pra river estuary. Twenty (20) species belonging to eleven (11) families have also been documented to occur in the associated wetlands. Of the 32 species sampled from the estuary, 24 were marine, the commonest being grey mullets *Liza falcipinnis*, *Liza dumerilii*, *Mugil bananensis* and *Mugil curema* (Mugilidae), the marine catfish *Arius latiscutatus* (Ariidae), *Ethmalosa fimbriata*, the threadfin *Galeoides decadactylus* (Polynemidae), the snapper *Pomadasys peroteti* (Haemulidae), and the pink shrimp *Penaeus notialis*. The brackish water fishes found were mainly the black-chinned tilapia *Sarotherodon melanotheron* (Cichlidae), the mudskipper *Periophthalmus barbarus* (Gobiidae), and the crab *Goniopsis pelii* (Grapsidae).

Of all the species found within the estuary and wetlands, the Black-Chinned Tilapia *Sarotherodon melanotheron* has been prioritised to be the most economically viable species to concentrate management actions on. Within the identified management area, local fishers have identified seven areas where the Tilapia usually spawn/breed (Figure 2). Although three other shellfishes were considered to be nutritionally significant, local fishers and processors indicated that these other species will also be targeted when Tilapia is well managed.

3.1: Biology of *Sarotherodon melanotheron*

The *Sarotherodon melanotheron* (fig. 3) was prioritized by all communities within the lower Pra as the top-most important species in terms of the local economy. This species is generally referred to as the Black-chin tilapia and locally as Mpatoa (in Fante language) and Akpa (in Eve language). It is recorded as the most abundant species in the Pra river estuary and associated tributaries. Standard length of *S. melanotheron* in the Pra River estuary ranges from 3.4 to 14.3cm. This species can tolerate high salinity and the fish is abundant in mangrove areas. They are nocturnal with intermittent daytime feeding on detritus, bivalves and zooplankton. The depth of water in which these fish are found varies with the changing tide. *S. melanotheron* generally breed every 22 days though sometimes they remain inactive for 2 months or more and spawn throughout the year, except in rainy seasons when spawning is reduced. *S. melanotheron* are primary and higher-level consumers in the ecosystems they inhabit, and are also prey for larger fish and predatory birds.

Population of *S. melanotheron* in the Pra estuary spawn between May and July, with minor spawning between September and February. Unsustainable fishing practices are contributing to the decline of the species in the Pra estuary. These practices, including the use of illegal nets such as beach seine, mosquito nets, and nets with mesh-size less than 1 inch, have contributed to the reduction in catch over the past decade, according to local fishers.



Figure 3: *Sarotherodon melanotheron* caught in the Pra Estuary. It is found to be the most abundant fish species

3.2: Present state and means of exploitation of *Sarotherodon melanotheron*

According to community members, current catches of tilapia have reduced drastically, as effort and technology for exploitation of the tilapia have improved over time. Local fishers usually trap *S. melanotheron* by various means, the most sustainable being the use of bare hands (mostly by women) to harvest them. Men on the other hand have developed strategies including the use of nets with mesh size not more than 1 inch to trap both adult and juvenile fish.

Major amongst the nets used are set nets (Figures 4 and 5), cast nets (Fig 7), monofilament nets and beach seine nets. Men usually set their nets, agitate the water with sticks towards the direction of the nets (Figure 8) in order to trap more fish in the set net. Mosquito nets (Figure 9) are also common and are usually deployed by children to capture fish. Through a Participatory Rural Appraisal, it was estimated that there were 300 (about 160 males and 140 females) actively involved in harvesting tilapia in the estuary. Most of these fishers live in Anlo Beach.



Figure 4: Set net being displayed by a fisherman to co-management committee members



Figure 5: A fisherman at Anlo Beach erecting a set net during low tide

During high tide, many fish overflow with the water to the other side of the net from the main river. When the water recedes during low tide, the Tilapia and other fish species are left trapped in the mud, and fishers collect them with scoop nets.



Figure 6: A fisherman at Anlo beach demonstrating how a scoop net is used



Figure 7: Fishermen throwing a cast net to capture fish in the Pra River



Figure 8: A fisherman agitating the water with a stick to drive tilapia towards a set net



Figure 9: Mosquito nets used for harvesting juvenile fish identified and displayed by FoN and Fisheries Commission officials during Participatory Rural Appraisal exercises

4.0 MANAGEMENT APPROACH

4.1 Existing Management Regime

At Anlo Beach community, some traditional norms exist to promote management of the fishery. They include no fishing during funerals and in case someone drowns, there is no fishing until the body is found.

Although the Fisheries Regulations sets minimum size limits of commercially important fish species, it does not mention *S. melanotheron*. The Regulations however forbid fishers from using seine nets in any riverine system unless that person obtains a permit from the Fisheries Commission. Nonetheless, fishermen use beach seine nets to fish in the estuary in violation of the regulations.

The PRA showed that all the communities within the Pra river estuary agreed to the introduction of management measures targeting the species, *S. melanotheron*. The management vision, objectives and management measures identified by the communities and stakeholders through consultative process, are outlined in this Fisheries Co-Management Plan. The changes expected for the fishery, community aspirations and recommendations provided through the bottom-up participatory process were useful in arriving at these management measures. The vision, objectives, approach and structure of the co-management committee, mandate and proposed management area were all discussed and agreed on by community members.

4.2 Vision, Objectives and Management Measures

The purpose/vision, objectives and management measures of this plan were developed by the various stakeholders constituting the Pra Fisheries Co-management Group. The goals and objectives are subdivided into thematic areas: biological, ecological, socio-economic and capacity development as indicated below.

4.2.1 Purpose/Vision

The purpose of this fisheries co-management plan for the Pra River estuary is to ensure a secured and improved fishery livelihood in the estuary so as to reduce poverty and enhance food security through sustainable fishery practices. During the vision development exercise, the local fishers stated their vision as:

“We want to see a secured and improved fishery livelihood in the lower Pra area so that our poverty will reduce, and we will have food every day from this same area”.

4.2.2 Objectives

The management objectives to achieve the purpose/vision of this co-management plan are divided into four main thematic areas and summarized below:

Biological

- Restore the Tilapia fishery and capture large sized Tilapia using large mesh sized nets.

Ecological

- Restore degraded mangroves in and around identified breeding sites.

Socio-Economic

- Improve living standards for local fishers by enhancing profitability of the fishery.

Capacity Development

- Develop capacities of local communities as well as the district assembly in a way that will promote sustained ecosystem management and achieve the district's objective of making the Pra estuary and associated ecosystem an eco-tourism hub.

4.3 Management Measures to Achieve Objectives

The following management actions, summarized in Table 1 below, are geared towards helping the achievement of the key objectives set out in this management plan. These management measures were agreed on by stakeholders of all the 11 communities who are part of the Pra Estuary Fisheries Co-Management Group. Consensus was reached through series of meetings and workshops where stakeholders and representatives from the 11 communities participated.

Table 1: Summary table of biological, ecological, socio-economic and capacity development objectives with their corresponding management measures

Management Objectives	Measures	Specific Action	Who to Lead
Biological Restore Tilapia fishery and capture large sized Tilapia using large mesh sized nets	Sustainable harvesting of Tilapia	Nets with mesh size of 2 Inches and above will be used to harvest Tilapia, instead of using 1 inch	Pra Fisheries Co-management Group (supported by Fisheries Commission, Shama District Assembly)
		Harvesting small sized tilapia is prohibited	
	Permanent and temporary Closure of selected breeding grounds	Outright ban of mosquito nets and beach seine nets in the estuary	

Management Objectives	Measures	Specific Action	Who to Lead
	<p><u>Closed Season</u></p> <p>The area where the Patakroma and Batorhu tributaries meet, often referred to as Aburitohu, has been noted as a sensitive area where Tilapia spawn usually between the months of May to July. This area is therefore demarcated as a closed area during the period of May to July, after which fishing in the area is allowed. The closed season area is shown in Figure 10. This plan will consider further expansion of the seasonal closure at a later date.</p> <p><u>Permanent Closure</u></p> <p>The area between Shama Apo and Anlo Beach, where River Pra meets the sea, is demarcated as permanently closed for all fishing. The area is 40.16 Hectares and shaded red in Figure 11</p>	<p>Mount sign posts near permanent and seasonal closed areas</p>	
<p><i>Ecological</i></p> <p>Improve the habitat quality for fishery resources.</p>	<p>Restore the ecological health and functioning of mangrove ecosystems in the Pra estuarine.</p>	<p>Nurse and plant mangrove seedlings within and around identified spawning sites as well as along banks of the Pra River as far as 50m off the river banks</p> <p>Regulate mangrove harvesting by establishing quotas</p>	<p>Pra Estuary Fisheries Co-management Group (with support from Wildlife Division)</p> <p>Pra Estuary Fisheries Co-</p>

Management Objectives	Measures	Specific Action	Who to Lead
		Mark poles and erect at vantage points to indicate no-go zones for mangrove harvesters	management Group
		Collaborate with Universities and researchers to assess water quality and monitor ecological conditions/health of the wetlands	University of Cape Coast – UCC (with support from Fisheries Commission)
Socio-Economic Improve living standards for local fishers	Enhance profitability of the Tilapia	Identify partners that can help develop diversified livelihoods.	Pra Estuary Fisheries Co-management Group
		Work with UCC researchers to determine size limits for the tilapia	UCC (with support from Fisheries Commission)
		Work with UCC and Fisheries Commission to monitor and compare size difference of the Tilapia over time especially after observing closed seasons for some time	UCC, Fisheries Commission
	Promotion of good practices through outreach events	Design and produce Information Education and Communication (IEC) materials on good estuarine fishing	Friends of the Nation (with support from Fisheries Commission, Wildlife Division, EPA and Shama District Assembly-SDA)
		Periodic briefings with advisory group and communities on	Pra Estuary Fisheries Co-status of

Management Objectives	Measures	Specific Action	Who to Lead
		implementation of measures and discuss challenges	management Group
Capacity Development Develop capacities of local communities in a way that will promote sustained ecosystem management	Build institutional linkages and nested governance mechanisms for the management of the area.	Improve cordiality and formalize relationship between the local fishers in all the communities and their immediate government – the Shama District Assembly as well as other agencies including Fisheries Commission, Wildlife Division of the Forestry Commission, and Environmental Protection Agency	Pra Estuary Fisheries Co-management Group (with support from Shama District Assembly)
	Strengthen local communities' active participation in decision making on sustainable fisheries management	Identify training needs of the co-management group and seek support from advisory group	Pra Estuary Fisheries Co-management Group (with support from FoN, Fisheries Commission, Wildlife Division, EPA and the SDA)
		Annually review this co-management plan with communities	Pra Estuary Fisheries Co-management Group (with support from the advisory group)



Figure 10: A map showing the area that has been marked for closed season implementation

(Source: Friends of the Nation/Hen Mpoano, 2018)

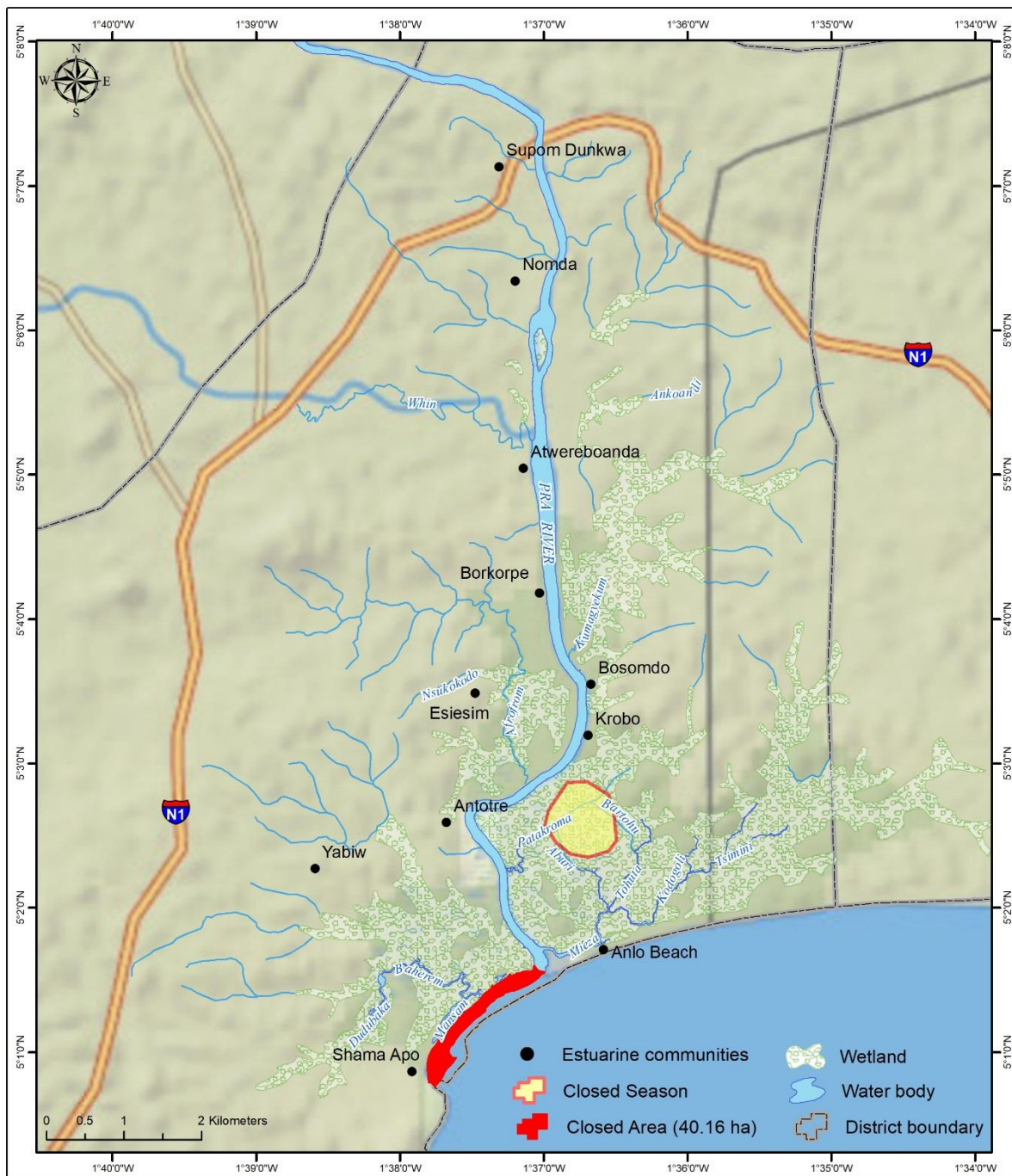


Figure 11: A map showing permanently closed area and an area to be closed seasonally

(Source: Friends of the Nation/Hen Mpoano, 2017)

5.0 IMPLEMENTATION ARRANGEMENTS

In Ghana, the legal frameworks for fisheries management are expressed in the Fisheries Act 2002 (Act 625), Fisheries (Amendment) Act 2014 (Act 880), Fisheries Regulations 2010 (LI 1968), Fisheries (Amendment) Regulations 2015 (LI 2217), Fisheries and Aquaculture Sector Development Plan (FASDP), and the National Marine Fisheries Management Plan (NMFMP). While these plans and legislations incorporate some statements and provisions on co-management, they provide little guidance on practical implementation arrangements for co-management in the country's fisheries sector. However, the new Co-Management Policy prepared under the auspices of MoFAD and the FC provides sufficient guidance on implementation of co-management systems for all types of fisheries ecosystems found in Ghana.

Critical to the successful implementation of this community-based fisheries management plan is the need for institutional collaboration, devolution of authority, assignment of responsibilities and finally, allocation of financial and material resources for implementation of the plan.

Institutional collaboration among stakeholders during implementation of this plan will occur at the regional, district and community levels. The regional Fisheries Commission will coordinate with regional governmental institutions such as the Wildlife Division of the Forestry Commission and Environmental Protection Agency (EPA) in the provision of technical advice and services for the sustainable management of estuarine fisheries and associated natural resources.

At the district level, there will be a collaboration with the Shama District Assembly and the Shama Traditional Council as well as with relevant non-governmental and private sector organizations operating at the district level to share information and build synergies towards implementation of related activities. The Shama District Assembly will provide operational permit in recognition of the activities of the Pra Estuary Fisheries Co-Management Group. Additionally, the assembly through collaboration with FC's zonal focal persons will monitor implementation progress and activities of the Pra Estuary Fisheries Co-Management Group.

Authority for management of the Pra River estuarine fishery is hereby granted by the Fishery Commission to the Pra Estuary Fisheries Co-Management Group. The co-management group is made up of all stakeholders involved in harvesting of Tilapia including male and female fishers, as well as fishmongers from the identified 11 communities within the management area who have interest in the sustainability of the Tilapia fishery. It also includes interested persons whose activities affect habitats of the species, i.e. mangrove harvesters. Stakeholders in the 11 communities that form the co-management group have elected 15 members (made up of 10 men and 5 women) to form a co-management committee which will steer affairs of the co-management group. In order to function effectively, they will request, as and when needed, technical support and advice from various institutions including the Fisheries Commission, Shama District Assembly, Shama Traditional Council, Wildlife Division of the Forestry Commission, Environmental Protection Agency, University of Cape Coast and Friends of the Nation.

The Pra River Estuary Fisheries Co-management Group is registered and recognized by the Shama District Assembly with a certificate of registration (Appendix 1). The group is governed by a constitution which stipulates the objectives, roles and responsibilities as well as tenure of office of their committee members among others

(Appendix 2). Fishers of the 11 communities, who are members of this co-management group, are granted the exclusive use right to harvest the Tilapia resource within the management areas. The group, shall have the authority to set and modify management measures, enforce rules and impose sanctions throughout the entire fisheries management area. Rules will be formulated with all the fisher folks from the 11 communities. Final rules must go through extensive stakeholder engagement processes involving all estuarine and riverine communities with active participation of the fisheries co-management group members. The rules must be communicated in writing within 14 days to the regional Fisheries Commission for review to ensure consistency with national laws, regulations and policies and for information purposes to the, Shama District Assembly and Wildlife Division of the Forestry Commission for assistance in enforcement.

Membership of the group is open to all fishers and other stakeholders, from the 11 communities within the management area, who obtain their livelihoods from the management area, and have interest in sustainable management of the fishery and other resources. The group has the right to limit membership and therefore access rights to the Tilapia fishery.

Appointment to the Pra Estuary Fisheries Co-management Committee shall be done by stakeholders in each of the partner communities. To qualify as a committee member, one must have been confirmed as a group member with good standing. Such preferred candidates will be nominated and approved by the communities where they live, to serve a tenure of two years. They may serve for a second term, after which, they are disqualified to become Executive committee members. This will give other group members the opportunity to serve on the committee for a period of two years. Membership of the committee shall not exceed 15, and must not be less than 11.

5.1 Institutional Roles and Responsibilities

The following are institutional roles and responsibilities for effective implementation of this co-management plan:

5.1.1 Pra Estuary Fisheries Co-management Committee.

- Undertake periodic patrols around the proposed management area to monitor the extent of compliance of the set rules.
- Develop progressive action plans for the implementation of this plan.
- Set management measures including seasonal and permanent closure of areas, rules on gear restriction and harvest size in consultation with resources users and other stakeholders affected by the management plan.
- Embark on awareness raising and outreach campaigns associated with implementation of this plan.
- Develop and adopt bye-laws for the co-management committee.
- Annually review implementation plan in consultation with key stakeholders.
- Develop performance indicators and performance tracking tools to monitor progress of plan implementation.
- Engage Shama District Assemblies to include and budget for comprehensive ecological and social research in the Pra estuary, through its medium term planning.

- Engage Friends of the Nation and other CSO Partners for technical and financial support for implementation of the plan.

5.1.2 Fisheries Commission (Western Region)

- Provide financial and technical support for the co-management committee.
- Make recommendations to the Executive Director of the Fisheries Commission for the approval of this co-management plan and substantive revisions.
- Support the committee to organise awareness raising and outreach campaigns associated with implementation of this plan.
- Support enforcement of rules to strengthen voluntary compliance actions by the co-management group.
- Facilitate training programs on Fisheries value chain and other relevant areas for the co-management group and their communities.
- Review the Co-Management Plan and revisions to the plan to ensure consistency with national fisheries policies and laws.

5.1.3 Shama District Assembly

- Incorporate management and conservation measures for the protection of Pra estuarine area into their medium-term development plans.
- Provide operating permit for the management committee.
- Provide financial and technical support for implementation of the plan.
- Leverage funding support from private sector organisations to support implementation of the co-management plan.
- Allocate budget for implementation of this plan through the district medium-term development plans.
- Monitor progress of implementation and provide feedback to estuarine management committee to enhance their activities.
- Support implementation of management plan.

5.1.4 Civil Society Organisations such as Friends of the Nation and CEWEFIA

- Promote eco-tourism for the Lower Pra area.
- Organize training workshops on co-management, leadership, etc. for the co-management group.
- Organize study tours, experience sharing visits and regional exchange visits to enhance collaborative management of the fisheries.
- Support awareness creation and communications on the fisheries laws through community meetings and radio discussions.
- Facilitate stakeholder engagement and planning activities associated with implementation of this plan.

- Provide additional logistics, human and financial resources in support of implementation of this plan.

5.1.5 Wildlife Division of the Forestry Commission and Environmental Protection Agency

- Support the promotion of eco-tourism for the Lower Pra area.
- Provide technical and training support for mangrove restoration efforts.
- Provide technical and advisory support for effective implementation of this management plan.

5.1.6 Universities and Research Institutions

- Conduct impact assessment of implementation of the closed areas on Tilapia as well as other species.
- Conduct water quality and sediment assessments including level of contamination.
- Collaborate with the co-management group to conduct any other relevant research within the management area.

5.1.7 Shama Traditional Council

- Provide advisory support to the co-management committee.
- Help the co-management group to resolve conflicts that may arise.

5.2 Financial Proposals

Potential sources of funds for implementation of this plan include the following:

- Fisheries Development Fund.
- District Assembly's Common Fund.
- Internally Generated Funds from District Assembly.
- Grants from International organizations.
- Grants from Non-Governmental Organizations.
- Donations from individuals and private companies as part of corporate social responsibility arrangements.
- Revenue from fish harvesting fees.

6.0 ENFORCEMENT OF MANAGEMENT MEASURES AND SANCTIONS FOR VIOLATORS

The 11 communities have collectively agreed on the following approach to enforce management measures outlined in the plan. They have, during community engagements, developed some graduated sanctions to be meted out to those who commit infractions. These sanctions are consistent with the Fisheries Act and its amendments, LIs and the Local Governance Act.

Rules and Regulations set out by the user group and their communities include

- No fishing with nets with stretch mesh sizes below 2 inches.
- No harvesting of small sized Tilapia (i.e. below two inches).
- No fishing during closed season in the designated area.
- No fishing in the permanently closed area.
- No harvesting of mangroves near the banks of the Pra River and Estuary (harvesting should only be done beyond 50-meters off the banks).

6.1 Enforcement of Management measures

Enforcement of rules and regulations governing the Pra estuary community-based fisheries management and prosecution of offenders shall be carried out by the following institutions as agreed by the communities:

The members of the Pra estuary fisheries co-management group will identify violators of rules through self-policing. Committee members of the group will review cases of reported violations and recommend appropriate sanctions against offenders to their Community Chief and his council of elders for careful consideration of all alleged cases.

The Chief and his council shall adjudicate each case with representatives of the committee members and make a determination of guilt or innocence and recommend appropriate sanctions guided by Section 6.2 below. The offender can appeal against his conviction or fine to the Assemblyman of the electoral area who can request the adjudication team to reconsider sanction or fine with stated justification.

If the offender refuses to pay the fine or other penalties, the committee can refer the case to the District Assembly, Regional Office of the Fisheries Commission and the police and district courts for subsequent and necessary actions.

6.2 Sanctions and Penalties for Infractions

In the case of infractions, the sanctions to be applied will be graduated as follows:

- **1st Offense:** Warning (education and sensitisation). First time offenders, will be warned and made to sign a bond to be of good behavior. The committee will use the opportunity to provide further education on components of the management plan and measures to the offender.
- **2nd Offense:** Payment of a fine not more than GH¢ 500.00. The decision as to the exact fine will be made collaboratively by the committee and community chiefs or elders or chief fisherman, whichever is applicable. In the case where consensus is not reached, or there is a feeling of unfair treatment by the Committee, both parties or the dissatisfied party can appeal for redress to the

following institutions; The Shama Traditional Council, the Shama District Assembly and the Fisheries Commission in the order presented until an amicable conclusion is reached.

- **3rd Offense:** Seizure of gears and catch/harvest. For a third consecutive offense, all the apparatus used for the operation at that time will be seized and action communicated to the Shama Traditional Council, Shama District Assembly and Fisheries Commission in the order presented, for necessary advise on the way forward.

7.0 MONITORING AND EVALUATION

The Pra Estuary Fisheries Co-Management Group will undertake annual review of progress on achieving the set objectives of this co-management plan. The reviews will be conducted in a meeting together with representatives of the Fisheries Commission, Shama District Assembly, Wildlife Division of Forestry Commission, Environmental Protection Agency, Civil Society, Research institutions, and Traditional authorities. Such periodic reviews will focus on the following:

- Successes of the management approach (degree to which objectives are being met).
- Extent of compliance with management measures and rules.
- Status of the Tilapia stocks and whether fish catches are stable or increasing.
- Challenges of implementing enforcement actions, sanctions, and penalties.
- Status of funds obtained from fines – amount collected and if any disbursed or expensed.
- Impacts of mangrove conservation activities.
- Status of illegal mining activities in the management area and impacts on plan implementation.
- The way forward for the group.

The review will be guided by the measurable indicators and means of verification spelled out in Table 2 below.

Table 2: Monitoring and evaluation plan for the Pra estuary fishery management area

Management Objective	Management Actions(s)	Measurable Indicators	Means of Verification	Base Line	Target	Frequency	Critical Assumption	Responsibility	Duration	
									From	To
Sustainable harvesting of Tilapia	Nets with mesh size of 2 inches and above will be used to harvest Tilapia,	All nets being used in the Pra estuary will have minimum mesh size of 2 inches	Nets belonging to all Fishers nets mesh size measured to monitor changes. Measurements done with the hand or other appropriate tool	0	200	Monthly	Community-based patrol teams will sample and measure nets of fishers	Community based management group and Fisheries Commission	2021	2024
	Harvesting small sized tilapia is prohibited	Harvested Tilapia from the estuary measure at least 2 inches	Records of sizes of randomly samples Tilapia catch of fishers	0	500	Monthly			2021	2024
Permanent and Temporary Closure of Breeding grounds	Outright ban of the use of mosquito nets and beach seine nets within the estuary	No mosquito nets or beach seine nets observed to be used in the estuary	Number of illegal mosquito nets seized and reported by the co-management group members	0	10	Quarterly	Information circulated in all communities on the ban of use of mosquito nets and captured in the District Assembly bye-law	Fisheries Commission, Co-Management Committee, FoN, Shama District Assembly	2021	2022
	Mount sign posts near permanent and seasonal closed areas	Sign posts are erected around permanent and seasonal closed areas	Photo and progress report	0	10	Annual		Co-Management Committee, Fisheries Commission, FoN	2021	2024

Management Objective	Management Actions(s)	Measurable Indicators	Means of Verification	Base Line	Target	Frequency	Critical Assumption	Responsibility	Duration	
									From	To
Restore ecological health and functioning of mangrove ecosystems in the Pra estuarine area	Nurse and plant mangrove seedlings within and around identified spawning sites as and along banks of the Pra River/ rivulets to 50m off the river banks	By 2022, mangrove seedlings are planted within and around identified spawning sites	Counting of planted mangrove seedlings	0	2500	Annually	10,000 seedlings	Co-Management Committee, Wildlife Division, Friends of the Nation	2021	2024
	Regulate mangrove harvesting by establishing quotas	Quotas are established according to zones for all registered mangrove harvesters	Meetings held on Zonation of Mangrove areas with stakeholders	0	8	Annually	Agreement with Shama Traditional Council on rights to harvest	Co-Management Committee, Traditional Authority, District Assembly, FoN	2021	2024
	Mark poles and erect at vantage points to indicate no-go zones for mangrove harvesters	Bamboo sticks are painted and mounted around designated no-go-zones. This is replicated for all other identified no-go-zones	GPS coordinates are picked at areas where painted bamboo sticks are mounted	2	6	Annually	New Potential sensitive areas identified	Co-Management Committee, Wildlife Division, FoN	2021	2024

Management Objective	Management Actions(s)	Measurable Indicators	Means of Verification	Base Line	Target	Frequency	Critical Assumption	Responsibility	Duration	
									From	To
	Collaborate with Universities and researchers to assess water quality and monitor ecological conditions/health of the wetlands	At least three (3) ecological assessments (physical and biological) conducted within the wetlands	Three assessment documents or Scientific reports from researchers available	2	6	Annual	Students and Faculty of the Universities will undertake studies in the Pra estuary	UCC, Fisheries Commission, FoN	2021	2024
Enhance profitability of Tilapia	Work with UCC researchers to determine size limits for the tilapia	Documentation of changing sizes of Tilapia harvested	Reports, Success stories, workshops	0	4	Annual	Arrangement with UCC and Fisheries Commission to document landings of fish	Fisheries Commission, UCC, FoN-Co-Management committee,	2021	2024
	Work with UCC and Fisheries Commission to monitor and compare size difference of the Tilapia over time especially after observing closed seasons for some time.	Increased sizes of harvested fish	Photo of evidence, Documentation and Analysis of fish landings	0	4	Annual	Program of Work to monitor fish landings over the period	Fisheries Commission, UCC, FoN-Co-Management committee,	2021	2022
Promotion of good practices through outreach events	Design and produce Information Education and Communication (IEC) materials	Two thousand copies of IEC materials are produced and shared with stakeholders	Number of IEC materials distributed and/or mounted	1	4	Annually	Funds available to produce IEC materials	FC, FoN,	2021	2022

Management Objective	Management Actions(s)	Measurable Indicators	Means of Verification	Base Line	Target	Frequency	Critical Assumption	Responsibility	Duration	
									From	To
	on good estuarine fishing									
	Periodic briefings with advisory group and communities on status of implementation of measures and discuss challenges	At least five periodic meetings are held with a wider multi-stakeholder group	Number of meetings held	0	4	Annual	Availability of funds to hold meetings	Fisheries Commission, Friends off the Nation, Co-Management Committee, District Assembly	2021	2024
Build institutional linkages and nested governance mechanisms for the management area	Formalize relationship between Co-Management Committee, Traditional Authority, Shama District Assembly, Fisheries Commission, Wildlife Division and Environmental Protection Agency	Formal and informal interactions held between communities and Shama District Assembly with traditional and regional representatives	Number of interactions held and documented	0	20	Annual	All stakeholders committed to formalization of meetings for holistic management of the estuary	Fisheries Commission, Friends off the Nation, Co-Management Committee, District Assembly	2021	2024
Strengthen active participation in decision making	Identify training needs of the co-management group and seek support from advisory group	Training needs assessment conducted	Number of assessment reports	0	2	Bi-annually	Co-Management Committee identify areas of need for resource	Fisheries Commission, Co-Management Committee,	2021	2024

Management Objective	Management Actions(s)	Measurable Indicators	Means of Verification	Base Line	Target	Frequency	Critical Assumption	Responsibility	Duration	
									From	To
among local communities							users and other community members	FoN, Business Advisory Centre		
	Annually review this Co-Management plan with communities	Review meetings conducted	Number of review meetings and their reports	0	4	Annually	Fisheries Commission driving the review process and budgeted for meetings	Fisheries Commission, Co-Management Committee, FoN,	2021	2024

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APPENDIX 1: CERTIFICATE OF REGISTRATION



Figure 12: Certificate of Registration, Shama District Assembly

APPENDIX 2: CONSTITUTION OF THE PRA ESTUARY FISHERIES CO-MANAGEMENT GROUP

PREAMBLE

We, fishers of all 11 communities lying along the Pra River and its estuary, in order to sustainably manage our fisheries resources to ensure a secured and improved livelihood, do ordain and establish this constitution for the Pra Estuary Fisheries Co-Management Group.

1.0 ESTABLISHMENT

There is hereby established a group to be known as the PRA ESTUARY FISHERIES CO-MANAGEMENT GROUP

2.0 NAME OF TRUST

The group shall be known as the PRA ESTUARY FISHERIES CO-MANAGEMENT GROUP and will be led by a committee to be known as the PRA ESTUARY FISHERIES CO-MANAGEMENT COMMITTEE (hereinafter in this constitution called 'the Co-management Committee')

3.0 ADDRESS FOR SERVICE

The address for service (for the group) will be:
Pra Estuary Fisheries Co-Management Group
C/o Shama District Assembly
P.O Box 37
Shama.

4.0 LOCATION

The area of the Pra Estuary Fisheries Co-Management Group comprises 11 communities along the Pra River listed in Appendix 3.

5.0 OBJECTIVES

The objectives of the Committee are:

- *Restore Tilapia fishery and Capture large sized Tilapia using large mesh sized nets.
- *Restore degraded mangroves in and around identified breeding sites.
- *Improve living standards for local fishers by enhancing profitability of the fishery.
- *Develop capacities of local communities as well as the district assembly in a way that will promote sustained ecosystem management and to achieve the district's objective of making the Pra estuary and associated ecosystem an eco-tourism hub.

6.0 MEMBERSHIP

To become a member a person is required to satisfy the following conditions

- *Subscribe to the objectives of the Committee.
- *Should be engaged in any aspect of the fishing industry associated with the Pra catchment area.
- *Must be 18 years and above.
- *Must comply with all bye-laws.

7.0 RIGHTS OF MEMBERS

To sustainably utilize the fish resources of the Pra river.

To elect members of the Committee.

Right to attend and vote at Annual General Meetings or any Special General meeting.

8.0 OFFICERS

The following shall be officers of the Committee

- Chairperson.
- Secretary.
- Treasurer.
- Organiser.

These officers shall constitute the management board of the committee and shall serve for a term of two years for up to a maximum of two terms.

9.0 ELECTION OF OFFICERS

A person shall not qualify to be elected unless he/she

- *Is a member off the Committee with good standing.
- *Has the support of 2 registered members for nomination.

9.1. Procedure for elections

The registered members of the Committee shall elect the officers under the supervision of the District Fisheries Zonal Officer.

A vacancy created in any office shall be filled by an election by the members of the Committee.

9.2 Expulsion from Committee

Any member may be expelled from the Committee by a majority vote of the members at the Annual meeting.

Any member who fails to attend 4 (four) successive meetings of the Committee. It is the Chairperson's duty to warn the members accordingly after two successive absences.

Any members who is convicted of a criminal offence

The Committee may refer disciplinary problems to Traditional Authority and advisory board.

10.0 DUTIES OF ELECTED OFFICIALS

10.1 The duties of the Chairperson are to:

- Chair meetings of the Committee.
- Represent the Committee at functions/meetings that it has been invited to.
- Act as spokesperson for the Committee when necessary.

10.2 The duties of the Secretary are to:

- Take and keep minutes of meetings.
- Prepare the agenda for meetings of the Committee in consultation with the Chairperson.
- Maintain the membership list.
- Deal with correspondence.
- Collect and circulate any relevant information within the Committee.

10.3 The duties of the Treasurer are to:

- Supervise the financial affairs of the Committee.
- Keep proper accounts that show all monies collected and paid out by the Committee.

10.4 Duties of Organiser

- To act in the absence of the Chairman.
- To arrange for meetings and ensure proper participation.

11.0 PROCEEDINGS OF THE COMMITTEE

Committee should meet at least once every month, on the first week of the month. Meetings of the committee should also be convened at the request of at least 5 members of the committee.

It is the duty of the Chairman to convene meetings, whether regular or special committee meetings. Members of the committee should be given at least 7 days' notice of the proposed meeting.

The presence of half of registered committee members at a meeting shall constitute a quorum.

Minutes of all meetings must be maintained by the Secretary and countersigned by the Chairperson.

12.0 DUTIES/FUNCTIONS OF THE COMMITTEE

The Committee provides a forum for dialogue and debate within the fishing communities, for identification of problems, and formulation of solutions.

The Committee acts as a two-way channel of communication between the fishing communities and the Fisheries Commission and other government and traditional authorities.

The Committee is committed to collaborating with the Fisheries Commission in the collection of data on the fishery for monitoring and better management.

13.0 COMMON SEAL

The Committee shall have a common seal, which shall consist of an embossed stamp with the words "PRA ESTUARY FISHERIES CO-MANAGEMENT GROUP".

The common seal shall be kept in the custody of the Chairperson of the Committee and shall not be affixed to any instrument except by authority of a majority of the members of the Committee, and in the presence of such majority.

14.0 AMENDMENT OF THE CONSTITUTION

This Constitution may be amended in whole or in part provided that any proposal for amendment is supported by a two-thirds (66%) majority vote in a General Meeting of the Committee.

No amendment of this Constitution shall have any binding effect unless and until notice of the same is sent to the Shama District Assembly, including a confirmed set of minutes of the meeting at which the resolution was made, and duly registered.

15.0 DISSOLUTION OF THE COMMITTEE

The Committee may be dissolved if it becomes apparent that good and sufficient reasons exist for the dissolution thereof.

Should 6 members move a motion that the Committee be dissolved, the Committee shall call a Special General Meeting (SGM) at which it will lay before the members at such meeting the reasons for the proposed dissolution, and in the event that a two-thirds (66%) majority vote of the members present and voting approve such dissolution, the Committee shall be dissolved.

Any funds or assets standing to the credit of the Committee after dissolution thereof shall be paid and distributed as follows:

For payment of all outstanding debts or liabilities of the Committee, and costs and expenses incurred in the dissolution thereof.

Any balance remaining thereafter shall be disposed in accordance with the decision of the majority of members present and voting at an AGM or SGM, whichever applies.

16.0 LANGUAGE

The formal document of this Constitution shall be in the English language but copies of Fante and Ewe versions shall be produced for accessibility by members, provided that the English version shall take precedence over the vernacular version in case of disparities between them.

17.0 EFFECTIVE DATE

This Constitution shall enter into force upon the registration thereof by the Shama District Assembly and forthwith the Committee shall come into operation.

18.0 LAW APPLICABLE

The performance of Committee and interpretation of its terms shall be governed by the Laws of Ghana.

Signed byon day of20.....

CHAIRMAN OF PRA ESTUARY FISHERIES CO-MANAGEMENT COMMITTEE

APPENDIX 3: COMMUNITIES OF THE PRA ESTUARY FISHERIES CO-MANAGEMENT GROUP

- Shama Apo.
- Anlo Beach.
- Krobo.
- Bosomdo.
- Antotre.
- Bokokorpe.
- Yabiw.
- Atwereboanda.
- Nomda.
- Esiesim.
- Supom-Dunkaw.

PRA ESTUARY COMMUNITY BASED
FISHERIES MANAGEMENT PLAN
DECEMBER 2020

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